Translation of Japanese Patent Application Publication

(Examined) No.: Sho-35-7175

Publication Date: June 15,1960

Application Date: March 12, 1958

Application No.: Sho-33-6612

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TOY CONTROLLING APPARATUS

Brief Description of Drawings

The drawings show an embodiment of the present invention in which:

FIG. 1 is an electrical wiring diagram of a transmitter;

FIG. 2 is an electrical wiring diagram of a receiver;

FIG. 3 is a top view showing a drive apparatus of a changeover switch;

FIG. 4 is a side view showing a drive mechanism of the changeover switch;

FIGS. 5 and 6 are side views showing the structure of the changeover switch;

FIG. 7 is a sectional view showing an electromotive mechanism for controlling the running direction of an electromotive motor vehicle to which the present

invention is implemented;

FIG. 8 is a side sectional view showing the same electromotive motor vehicle; and

FIG. 9 is a top view of a pilot lamp showing the operation of the apparatus of the present invention.

Detailed Explanation of the Invention

In the present invention, a toy controlling apparatus for remotely controlling an operation of an electromotive toy, comprising a motor configured to start an rotation by communication of a control signal, and an operation switching apparatus driven by the motor, wherein another electromotive mechanism operating by an electric circuit closed when the control signal does not arrive is provided, and an operation of the electromotive mechanism stops during switching the operation switching apparatus and is started when the operation switching stops.

It is an object of the present invention to obtain a toy controlling apparatus capable of selecting an arbitrary operation to control a controlled toy performing two or more kinds of operations. In a conventional toy radio-controlled apparatus (radio control), it was impossible to operate a toy performing several kinds of operations by selecting an arbitrary operation thereof.

That is to say, in a conventionally publicly known radio-controlled toy motor vehicle or the like, though it was possible to control the various operations of the motor vehicle such as the starting, the right movement, the left movement, the stopping and the like in the order of events, it was impossible to control the motor vehicle by selecting arbitrary one operation without following the operation order.

Because the present invention can control the motor vehicle in order that the motor vehicle may operate by selecting any one of two or more operations among, for example, forward movement, right movement, left movement, stopping, backward movement and the like, the variations of the operations range over many kinds. Moreover, the structure is simple as it will be described later. Consequently, the controlling apparatus has a large utility value.

In the following, the principle of the present invention will be described with reference to the drawings.

In FIG. 1, a transmitter 10 is a radio transmitter for operating a toy to be controlled from afar. A power source battery 12 of a Tesla coil 11 is connected through a vibrating contact 13 and a switch 15.

When a push button 14 is pushed into the direction of the left-pointing arrow in FIG. 1, the switch 15 is

closed, and the Tesla coil 11 is connected to the battery 12. Then, the vibrating contact 13 is opened and closed in a vibrating manner by the magnetic force of the Tesla coil 11 to produce a high voltage at both the ends of the Tesla coil 11, and an electric discharge is generated to a spark gap 16. An electromagnetic wave signal generated at this time is transmitted by an antenna 17.

In FIG. 2, a controlled body 20 is supposed to be, for example, an electromotive motor vehicle. The electromagnetic wave signal being incoming communication to an antennal 21 is rectified by a detector to flow a rectified current through the exciting coil of a relay 24.

A choke coil 23 prevents the high frequency current.

A contact 30 of the relay 24 connects a battery 26 to a motor 27.

A switch 28 is a switch for opening and closing the circuit of the battery 26.

The contact 31 of the relay 24 is connected to a motor 48 and control coils 49 and 50 through contacts 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46 and 47.

Moreover, the contact 31 connects the battery 26 to an indicating bulb 118. That is to say, when a current flows through the exciting coil of the relay 24, a movable piece 25 is attracted by the magnetic field of the exciting coil of the relay 24 to contact with the

contact 30. Then, the battery 26 is connected to the contact 30. Moreover, when no current flow through the exciting coil of the relay 24, the movable piece 25 moves upward in FIG. 2 by the force of a spring 29 to make the battery 26 be connected with the contact 31.

In FIG. 3, an armature shaft 51 of the motor 27 rotates a reduction shaft 53 through a reduction unit 52.

A cam gear 54 is provided with teeth 55 on a part thereof, as shown in FIG. 4, and the teeth 55 are engaged with teeth 57 formed on a part of a drive piece 56.

A shaft 62 is fitted into a hole formed at the center portion of the drive piece 56 with a play.

The shaft 62 is supported by bearings 59, 60 and 61 rotatably to a fixed portion of the apparatus.

A feed cam 63 is firmly fixed to the drive piece 56, and the feed cam 63 is fitted into the shaft 62 with a play to be freely rotatable.

A cam 64 engaged with the feed cam 63 is set to be attached to the feed cam 63 always with a pressure by a spring 65. The cam 64 is set to be constituted together with the shaft 62 in a manner in which the cam 64 can move into the shaft direction of the shaft 62 by splines but cannot move into the rotation direction of the shaft 62.

Consequently, when the reduction shaft 53 rotates and the teeth 55 of the cam gear 54 are engaged with the

teeth 57, the drive piece 56 rotates in the left side directed arrow direction in FIG. 4, and the feed cam 63, which is firmly fixed to the drive piece 56, rotate the cam 64.

Then, when the reduction shaft 53 continues to rotate in the right side directed arrow direction in FIG. 4, the engagement of the teeth 55 and the teeth 57 comes off, and the drive piece 56 is set to return to the position of a stopper 58 in FIG. 4 by a spring 84 provided at a part of the drive piece 56.

That is to say, when the cam gear 54 continues to rotate as the right side directed arrow, the drive piece 56 stepwise drives the cam 64 by a certain fixed angle, e.g. 60 degrees, through the feed cam 63.

Cams 66 and 67 are axially fixed to the shaft 62, and are set to press leaf springs 80, 81, 82 and 83 as shown in FIGS. 5 and 6.

Insulating stands 68, 69, 70 and 71 are firmly fixed at the tip portions of the leaf springs 80, 81, 82 and 83, respectively.

Contacts 32 and 33 are provided on the insulating stand 68, contacts 34 and 35 are provided on the insulating stand 69, contacts 36 and 37 are provided on the insulating stand 70, and contacts 38 and 39 are provided on the insulating stand 71.

Insulating stands 72, 73, 74 and 75 are loosely

held by holders 76, 77, 78 and 79, respectively.

The contacts 40 and 41 are provided on the insulating stand 72 supported by the holder 76, the contacts 42 and 43 are provided on the insulating stand 73, the contacts 44 and 45 are provided on the insulating stand 74, and the contacts 46 and 47 are provided on the insulating stand 75.

FIG. 8 shows an electromotive motor vehicle to which the apparatus of the present invention is implemented. The motor 48 for driving wheels 106 of the controlled body 20 includes an inertia wheel 110 on its armature shaft, and the armature shaft of the motor 48 drives the wheels 106 through a gear 111 and a reduction apparatus 112.

A battery storage box 113 holds a battery 26 in the driven body 20. An operation switching apparatus 119 is an apparatus shown in FIG. 3. A bevel gear 114 axially fixed to the shaft 62 is engaged with a bevel gear 115, and a shaft 116 axially fixed to the bevel gear 115 rotates an indicating lamp 117.

The indicating lamp 117 is provided on the roof of the driven body 20 to display the rotation angle of the shaft 62.

FIG. 7 shows an electromotive drive apparatus for steering the wheels 104 and 105 to change the direction of the movement of the driven body 20.

In FIG. 7, a supporting frame 90 is firmly fixed to a part of the controlled body 20 of FIG. 8, and a control rod 96 is provided so as to pierce two holes formed on parts of the supporting frame 90.

The control rod 96 firmly fixes an armature 94 at the center portion of the control rod 96, and the armature 94 is a movable element formed of an annular high permeability body such as iron.

Iron cores 86 and 87 provided at fixed points of the controlled body 20 include control coils 49 and 50, respectively. When the control coil 49 is excited, the magnetic field of the iron core 86 draws the armature 94 toward the observer's left-hand side of FIG. 7. Moreover, when the control coil 50 is excited, the magnetic field of the iron corer 87 draws the armature 94 toward the observer's right-hand side of FIG. 7. Moreover, when no currents flow through the control coils 49 and 50, the armature 94 is kept at the intermediate portion between the iron cores 86 and 87 by springs 97 and 98.

Steering arms 99 and 100 are set to be able to move into the arrow directions of FIG. 7 using shaft cores 108 and 109, respectively.

The steering arms 99 and 100 are connected with each other by means of a connecting rod 101.

The axles 102 and 103 of the wheel 104 and 105, respectively, are rotatably supported by parts of the

steering arms 99 and 100. Now, when a current flows through the control coil 49, the iron core 86 draws the armature 94, and the control rod 96 moves toward the observer's left-hand side in FIG. 7. The movement of the control rod 96 pushes the steering arm 99 to change the steering of the wheel 104, and transmits the movement of the steering arm 99 to the steering arm 100 through the connecting rod 101 to change the steering of the wheel 105.

Alternatively, when a current flows through the control coil 50, the iron core 87 draws the armature 94, and the control rod 96 moves toward the observer's right-hand side in FIG. 7. The movement of the control rod 96 pushes the steering arm 100 to change the steering of the wheel 105, and transmits the movement of the steering arm 100 to the steering arm 99 through the connecting rod 101 to change the steering of the wheel 104.

Consequently, when a current flows through the control coil 49, the wheels 104 and 105 change the course of, for example, the controlled body 20 toward the left side. When a current flows through the control coil 50, the wheels 104 and 105 change the course of, for example, the controlled body 20 toward the right side.

Here, the operation situation of the apparatus of the present invention is described. Now, when the push button 14 is pushed in FIG. 1, an electromagnetic wave

signal is transmitted from the antenna 17. The electromagnetic wave signal is received by the antenna 21 to flow a current through the exciting coil of the relay 24. Then, the movable piece 25 is contacted with the point 30 to connect the battery 26 to the motor 27.

In this case, the connection of the motor 48, and the control coils 49 and 50 with the battery 26 is cut off.

Consequently, the motor 27 starts to rotate, and the armature shaft 51 and the reduction shaft 53 in FIG. 3 rotate. The rotation of the reduction shaft 53 drives the cam 64 stepwise, for example, by 60 degrees, through the feed cam 63.

Accordingly, when the indicating lamp 117 is rotated by the shaft 116 engaging with the bevel gear 114 after the bevel gear 114 is axially fixed to the shaft 62, the indicating lamp 117 stepwise rotates into the direction of display 120, 121, 122, 123, 124 and 125 as shown in FIG. 9. Then, when the push button 14 is released now, the switch 15 opens its contact, and the electromagnetic signal from the antenna 17 stops its transmission.

Consequently, because the current in the exciting coil of the relay 24 stops, the movable piece 25 is contacted with the contact 31 by the force of the spring 29.

Then, in this case, when the cam 66 pushes the leaf spring 80 as shown in FIG. 5 to contact the contacts 32 and 33 with contacts 40 and 41, respectively, the motor 48 is electrically connected with the battery 26.

If the motor 48 is supposed to advance the motor vehicle in this case, the controlled body 20 advances toward the observer's right-hand side of FIG. 8.

Alternatively, in that case, because, when the cam 66 pushes the leaf spring 81, the contacts 34 and 35 contact with the contacts 42 and 43, and the motor 48 is connected with the battery 26 in the reverse direction, the controlled body 20 backs toward the observer's left-hand direction in FIG. 8.

Moreover, when the cam 67 pushes the leaf spring 82, the contacts 36 and 37 are connected with the contacts 44 and 45 to excite the control coil 50, and the controlled body 20, for example, advances and turns. Alternatively, when the cam 67 pushes the leaf spring 83 to contact the contacts 38 and 39 with the contacts 46 and 47, the control coil 49 is excited to advance the controlled body 20 toward the left side.

Then, when the movable piece 25 and the contact 31 contact with each other, the indicating bulb 118 of the indicating lamp 117 is lighted. When it is supposed that the display 120 is the front of the controlled body 20 and the display 123 is the rear of the controlled body 20

in FIG. 9, it is possible to make the indicating lamp 120 project a light beam into the advancing direction of the controlled body 20 when the motor 48 is operating.

That is to say, in FIG. 1, in the case where the push button 14 is pushed and the switch 15 is closed, a current generated by an electromagnetic wave signal from the antenna 17 flows through the relay 24, and the motor 27 is connected to the battery 26. Then, the indicating lamp 117 stepwise and continuously rotates, for example, clockwise in FIG. 9.

Then, in this case, when the push button 14 is released and the connection of the switch 15 is separated, the electromagnetic wave signal from the antenna 17 stops, and the movable piece 25 is drawn upward in FIG. 2 by the spring 29 to separate the connection of the movable piece 25 and the contact 30. Consequently, the rotation of the motor 27 stops, and the stepwise rotation of the shaft 62 also stops. Thus, the indicating lamp 117 stops rotating.

Then, in this case, when it is supposed that the indicating lamp 117 faces to the direction of, for example, the display 120 as shown in FIG. 9, the indicating lamp 17 stops at the position facing to the front of the controlled body 20, and the indicating bulb 118 is lighted and the controlled body 20 advances, because the indicating bulb 118 is connected to the battery 26 in this case.

Moreover, in the case where the push button 14 is pushed when the indicating lamp 117 arrives at the position of the display 121, the controlled body 20 similarly advances while performing the right-side changing of steering.

Moreover, in the case where the push button 14 is pushed when the indicating lamp 117 faces to the direction of the display 122, the controlled body 20 changes its direction to the right while backing.

Similarly, in the case where the push button 14 is pushed when the indicating lamp 117 faces to the direction of the display 123, 124 or 125, the controlled body 20 can back, back to the left, or advance to the left. In the embodiment described above, in the case where the communication of the electromagnetic wave signal stops and the current flowing through the exciting coil of the relay 24 stops when the indicating lamp 117 faces to the position of the display 120, the battery 26 is connected to the motor 48 to move the controlled body 20 to the front.

In this state, when the push button 14 is pushed to transmit an electromagnetic wave signal from the antenna 17 and the electromagnetic wave signal is received by the antenna 21 to flow a current though the exciting coil of the relay 24, the connection of the contact 31 and the battery 26 is cut. Consequently, the motor 48 begins to

stop its rotation.

In this case, because the inertia wheel 110 is provided on the shaft of the motor 48 as shown in FIG. 8, the armature shaft of the motor 48 continues to rotate by the inertia of the inertia wheel 110, and consequently the controlled body 20 continues to advance still a little while. Now, because the electromagnetic wave signal has arrived, the battery 26 is connected to the contact 30 to rotate the motor 27 continuously. By the rotation of the motor 27, the shaft 62 stepwise rotates. By the stepwise rotation of the shaft 62, the indicating lamp 17 stepwise rotates from the position of the display 120 to the positions of the display 121, 122 and 123 in FIG. 9.

Then, if the switch 15 is now opened by pushing the push button 14 when the indicating lamp 117 arrives at the position of the display 125, the transmission of the electromagnetic wave signal from the antenna 17 stops to end the arrival of the electromagnetic wave signal to the antenna 21.

Consequently, the current flowing through the exciting coils of the relay 24 stops, and the battery 26 is connected to the motor 48 and the control coil 49 through the contact 31.

Consequently, in this case, the controlled body 20 changes the steering to the observer's left-hand side,

and can advance to continue the left side advancing.

That is to say, in the embodiment described above, the current flowing through the motor 48 and the control coils 49 and 50 are cut while the electromagnetic wave signal arrives at the antenna 21, and the motor 48 is in the state in which only the armature shaft thereof continues to rotate by the inertia wheel 110.

Consequently, when the arrival of the electromagnetic wave signal to the antenna 21 continues for a certain fixed time, for example 10 seconds, or longer, the controlled body 20 stops all of the operation thereof.

Then, when the arrival of the electromagnetic wave signal to the antenna 21 stops, a current conducts through the motor 48 and the control coil 49 or 50, and the controlled body 20 performs any one of a forward movement, a leftward movement, a rightward movement and a backward movement.

That is to say, in the embodiment described above, during the arrival of the electromagnetic wave signal to the antenna 21, the controlled body 20 essentially does not start its movement, and the controlled body 20 keeps its movement that has been performed immediately before the arrival of the electromagnetic wave signal by the inertia by the inertia wheel 110. When the arrival of the electromagnetic wave signal to the antenna 21 stops,

the controlled body 20 starts its new action in accordance with which one of the display 120-125 the indicating lamp 117 points to at the time of the stopping.

That is to say, in the apparatus of the present invention, it is possible to select an arbitrary action among previously selected several actions to perform the selected action. The actions of the controlled body 20 are not necessarily performed in the previously determined order such as the order of the forward movement, the rightward movement, the leftward movement and the stopping like the conventional publicly known apparatus. It is possible to select an arbitrary action among the movements to perform the selected action.

As described above, the present invention is a toy controlling apparatus including a motor starting its rotation by a communication of an electromagnetic wave signal, for example, the motor 27, and a switching apparatus of the actions driven by the motor, for example, the apparatus of FIG. 3, wherein an electromotive mechanism for controlling the action of the toy, for example the motor 48 and the control coils 49 and 50, by means of an electric circuit which is closed when the electromagnetic wave signal disappears, for example the contact 31, is connected to a power supply, for example the battery 26. Consequently, it is possible to obtain a toy controlling apparatus capable of performing control

by selecting an arbitrary action in a controlled toy performing two or more actions.

Incidentally, at the time of the implementation of the present invention, it is not necessary to use an electromotive motor vehicle as the controlled body 20, and the present invention can be similarly implemented to any one of electromotive toys such as an electromotive animal, and an electromotive vessel.

The above-mentioned descriptions show only the embodiment of the present invention, and any forms can be taken at the time of implementing the present invention as long as the form departs from the sprit of the present invention.

Patent Claim

A toy controlling apparatus for remotely controlling an operation of an electromotive toy, comprising a motor configured to start an rotation by communication of a control signal, and an operation switching apparatus driven by the motor, wherein another electromotive mechanism operating by an electric circuit closed when the control signal does not arrive is provided, and an operation of the electromotive mechanism stops during switching the operation switching apparatus and is started when the operation switching stops.

Additions

1. A toy radio controlling apparatus according to the claim, comprising an indicating lamp operating with the operation switching apparatus.

2. A toy radio controlling apparatus according to the claim, wherein the other electromotive mechanism operating by the electric circuit is a motor for driving an operation of the electromotive toy, and the motor is provided with an inertia wheel on an armature shaft.

10	transmitter
11	Tesla coil
12	source battery
13	vibrating contact
14	push button
15	switch
16	spark gap
17	antenna
20	controlled body
21	antennal
23	choke coil
24	relay
25	movable piece
26	battery
27	motor
28	switch
29	spring
30-47	contact
48	motor
49-50	control coils
51	armature shaft
52	reduction unit
53	reduction shaft
54	cam gear
55	teeth
56	drive piece

57	teeth
58	stopper
59-61	bearings
62	shaft
63	feed cam
64	cam
65	spring
66-67	cam
68-75	insulating stand
76-79	holder
80-83	leaf spring
84	spring
86-87	iron core
90	supporting frame
94	armature
96	control rod
97-98	spring
99-100	steering arm
101	connecting rod
102-03	axle
104-105	wheel
106	driving wheel
108-109	core
110	inertia wheel
111	gear
112	reduction apparatus

113	battery storage box
114	bevel gear
115	bevel gear
116	shaft
117	indicating lamp
118	indicating bulb
119	operation switching apparatus
120-125	display

120 E 414
(120 E 44)

特許庁

特許出願公告

特許公報

昭35—7175

公告 昭 35.6.15　出願 昭 33.3.12　特願 昭 33—6612
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玩具操縦装置

図面の略解

図面は本発明の一実施例を示すものにして、第1図は送信機の電気的配線図、第2図は受信機の電気的配線図。第3図は切換スイツチの駆動装置を示す上面図、第4図は切換装置の駆動機構を示す側面図、第5図及び第6図は切換スイツチの構造を示す側面図、第7図は本発明を実施した電動自走車の走行方向を制御する電動機構を示す断面図、第8図は同じく電動自走車の側断面図、第9図は本発明の装置の動作を示す表示灯の上面図である。

発明の詳細なる説明

本発明は、電動具の動作を遠隔操縦する玩具操縦装置に於て、制御信号の来信によつて回転を開始する如くなした電動機と、該電動機によつて駆動される動作切換装置とを有し、且、該制御信号が到来しない時に閉路される電気回路によつて動作する他の電動機構を設け、該電動機構の動作は該動作切換装置の切換中は停止し、該動作切換が停止した時に開始される事を特徴とした玩具操縦装置である。

本発明の目的とする所は、二種以上の動作をなす操縦玩具に於て、任意の動作を選択して制御する事の出来る玩具操縦装置を得るにある。従来の玩具無線操縦装置（ラジコン）に於ては、数種の動作をなす玩具の任意の動作を選択して操作する事は不可能であつた。

即ち従来公知の無線操縦玩具自走車等に於ては、例えば発進、右進、左進、停止等の諸動作を順を追つて制御する事は可能であつたけれども、この動作順序を追わずに任意の一動作を選択して操縦する事は不可能であつた。

本発明に於ては例えば前進、右進、左進、停止、後進等の二種以上の動作の何れか一つを選択して動作する如く制御する事が出来るものであるから、動作の変化が多種に亘り、且その構造は後述する如く簡単であるから頗る実用価値大なる操縦装置である。

以下図面に於て本発明の原理を説明する。

第1図に於て、送信機10は操縦すべき玩具を遠方より操作する無線送信機であり、テスラコイル11の電源電池12は振動接点13及びスイツチ15を介して接続される。

押しボタン14を第1図の左向矢印方向に押せばスイツチ15が閉じてテスラコイル11は電池12に接続され、テスラコイル11の磁力によつて振動接点13が振動的に開閉してテスラコイル11の両端に高電圧を生じ、スパークギヤツプ16に放電を生ずる。この際に発生する電磁波信号はアンテナ17によつて送信される。

第2図に於て、被制御体20は例えば電動自走車であるとし、アンテナ21に来信した電磁波信号は検波器によつて整流され、リレー24の励磁コイルに整流電流を流す。

チヨークコイル23は高周波電流を阻止する。

リレー24の接点30は電池26を電動機27に接続する。

スイツチ28は電池26の回路を開閉するスイツチである。

リレー24の接点31は接点32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46及び47を介して電動機48及び制御コイル49及び50に接続される。

又接点31は電池26を表示電球118に接続する。即ちリレー24の励磁コイルに電流が流れている時には可動片25はリレー24の励磁コイルの磁界によつて吸引されて接点30に接触して電池26を接点30に接続し、又リレー24の励磁コイルに電流が流れていない時はバネ29の力によつて可動片25が第2図の上方に移行して電池26を接点31に接続せしめる。

第3図に於て電動機27のアーマチユア軸51は減速装置52を介して減速軸53を回転せしめる。

カムギヤ54は第4図に示す如くその一部に歯55を有して居り、駆動片56の一部に設けた歯57とかみ合つている。

駆動片56はその中心部分に設けた穴によつて軸62と遊び嵌め合になつている。

軸62は軸受59, 60, 61によつて装置の固定部分に対し回転自在に支持されている。

送りカム63は駆動片56に固着されて居り、送りカム63は軸62に対し回転自在に遊び嵌め合となつている。

送りカム63とかみ合つたカム64はバネ65によつて常時送りカム63に圧着されているものとし、カム64は軸62とスプラインズによつて軸62の軸方向には移動可能であるが軸62の回転方向には移動し得ない如く構成されているものとする。

よつて減速軸53が回転し、カムギヤ54の歯55が歯57とかみ合えば第4図に於て駆動片56は左手向矢印方向に回転し、駆動片56に固着された送りカム63はカム64を回転せしめる。

而して、減速軸53が第4図に於て右手向矢印方向に回転を続ければ歯55と歯57のかみ合ははずれ、駆動片56の一部に設けたバネ84によつて駆動片56は第4図の如きストツパ58の位置に復帰するものとする。

即ちカムギヤ54が第4図の右手向矢印の如く回転を続ければ駆動片56は送りカム63を介してカム64を或る一定角度、例えば60度ずつ階段的に駆動するものとなる。

カム66及び67は軸62に軸着して居り、第5図及び第6図に示す如く、板バネ80, 81, 82, 83を押し着ける如くなしている。

板バネ80, 81, 82, 83の先端部分には夫々絶縁台68, 69, 70, 71が固着してある。

絶縁台68には接点32及び33が設けてあり、絶縁台69

には接点34及び35が設けてあり、絶縁台70には接点36及び37が設けてあり、絶縁台71には接点38及び39が設けてある。

絶縁台72, 73, 74, 75は夫々ホルダ76, 77, 78, 79によつて緩やかに保持されている。

ホルダ76に支持された絶縁台72には接点40及び41が設けてあり、絶縁台73には接点42及び43が設けてあり、絶縁台74には接点44及び45が設けてあり、絶縁台75には接点46及び47が設けてある。

第8図は本発明の装置を実施した電動自走車であり、被制御体20の車輪106を駆動する電動機48はそのアーマチユア軸に慣性輪110を有して居り、電動機48のアーマチユア軸は歯車111を介し減速装置112を介して車輪106を駆動している。

電池収納箱113は電池26を被制御体20に保持する。動作切換装置119は第3図の如き装置であり、軸62に軸着した傘歯車114は傘歯車115とかみ合つて居り、傘歯車115に軸着した軸116は表示灯117を回転せしめる。

表示灯117は被制御体20の屋根の上に設けられて居り、軸62の回転角度を表示するものである。

第7図は被制御体20の車輪104及び105を操舵して被制御体20の進行方向を変化せしめる為の電動駆動装置である。

第7図に於て、支持枠90は第8図の被制御体20の一部に固着して居り、支持枠90の一部に設けた2ケの穴を貫通する如く制御棒96を設ける。

制御棒96はその中央部分にアーマチユア94を固着して居り、アーマチユア94は円環状の高導磁性体、例えば鉄によつて形成された可動素子であるとする。

被制御体20の固定点に設けた鉄心86及び87は夫々制御コイル49及び50を有して居り、制御コイル49が励磁された場合、鉄心86の磁界はアーマチユア94を第7図の向つて左手側に引寄せ、又制御コイル50が励磁された場合には鉄心87の磁界はアーマチユア94を第7図の向つて右手側に引寄せ、又制御コイル49及び50に電流が通じていない場合にはバネ97及び98によつてアーマチユア94は鉄心86と鉄心87の中間部分に維持される。

操舵腕99及び100は軸心108及び109を夫々軸として第7図の矢印方向に移動し得るものとする。

操舵腕99及び100は連絡棒101によつて互いに連結している。

車輪104及び105の夫々の車軸102及び103は操舵腕99及び100の一部に回転自在に支持されている。さて制御コイル49に電流が流れれば鉄心86はアーマチユア94を引寄せ、制御棒96は第7図に於て向つて左手側に移動し、その移動によつて操舵腕99を押して車輪104を転舵せしめ、又この操舵腕99の移動を連絡棒101を介して操舵腕100に伝えて車輪105を転舵せしめる。

或は又制御コイル50に電流が流れた場合は鉄心87はアーマチユア94を引寄せ、制御棒96は第7図の向つて右手側に移動し、操舵腕100を押して車輪105を転舵せしめ、その操舵腕100の移動を連絡棒101を介して操舵腕99に伝えて車輪104を転舵せしめる。

よつて制御コイル49に電流が流れた場合には、車輪104及び105は例えば被制御体20を左側に転進せしめ、制御コイル50に電流が流れた場合には車輪104及び105は、例えば被制御体20を右側に転進せしめる。

さて、本発明の装置の動作状況を説明するに、今第1図に於て押しボタン14を押せばアンテナ17より電磁波信号を発し、その電磁波信号はアンテナ21によつて受信されてリレー24の励磁コイルに電流を通じ、可動片25を接点30に接触せしめ、電池26は電動機27に接続される。

この場合電動機48制御コイル49及び50と電池26の接続は遮断される。

よつて電動機27は回転を始め第3図に於てアーマチユア軸51及び減速軸53が回転し、減速軸53のこの回転は送りカム63を介してカム64を例えば60度ずつ階段的に駆動する。

よつて軸62に傘歯車114を軸着し、傘歯車114にかみ合つた軸116によつて表示灯117を回転せしめれば表示灯117は第9図に示す如く、表示120, 121, 122, 123, 124, 125の方向へ階段的に回転する。而して今、押ボタン14を離せばスイツチ15は接触を開き、アンテナ17よりの電磁波信号は送信を停止する。

従つてリレー24の励磁コイルの電流は停止するから可動片25はバネ29の力によつて接点31に接触する。

而してこの場合に於て、カム66が第5図の如く板バネ80を押して接点32, 33を夫々接点40及び41に接触せしめていれば電動機48は電池26に電気的に接続される。

この場合電動機48が自走車を前進せしめるものとすれば、被制御体20は第8図の向つて右手側に進行する。

或いは又その場合に於て、カム66が板バネ81を押していれば接点34及び35が接点42及び43と接触して居り、電動機48は電池26に反対方向に接続されるから被制御体20は第8図の向つて左手側に後進する。

又カム67が板バネ82を押していれば接点36, 37が接点44, 45に接続して制御コイル50が励磁され、被制御体20は例えば右進して居り、又カム67が板バネ83を押して接点38及び39が接点46及び47に接触していれば制御コイル49が励磁されて被制御体20は左進する。

而して、可動片25及び接点31が接触すれば表示灯117の表示電球118が点灯するものであり、第9図に於て表示120を被制御体20の前方とし、表示123を被制御体20の後方とすれば電動機48が動作していれば表示灯120は被制御体20の進行方向へ光線を投射する如くなす事が出来る。

即ち第1図に於て、押しボタン14が押されスイツチ15が閉じている場合はアンテナ17よりの電磁波信号でリレー24に電流が流れて電動機27が電池26に接続されて、表示灯117が例えば第9図に於て時計方向に階段的に且連続的に回転している。

而してこの場合に於て、押しボタン14を離してスイツチ15の接続を離せば、アンテナ17の電磁波信号が止まつて可動片25がバネ29によつて第2図の上方に引かれ、可

動片25と接点30の接触が離たれるから電動機27の回転は停止し、軸62の階段的な回転も停止するから表示灯117は回転を停止する。

而してこの場合に於て、表示灯117が例えば第9図の如く、表示120の方向に向いていたとすればこの場合に於て表示電球118は電池26に接続されるから表示灯17は被制御体20の前方に向つた位置に於て停止し、且その電球が点灯され、又被制御体20は前進をする。

又表示灯117が表示121の位置に至つた時に押しボタン14を離せば同様にして被制御体20は右転舵し乍ら前進する。

又表示灯117が表示122の方向に向つた時に押しボタン14を離せば被制御体20は後進をし乍ら右に変進する。

同様にして表示123, 124, 125に夫々向つた時に押しボタン14を離せば被制御体20は夫々後進或いは後左進或は前左進する事が出来るものである。叙上の実施例にあつては、表示灯117が表示120の位置に向つている時に電磁波信号の来信が止んでリレー24の励磁コイルに電流が流れなくなれば電池26は電動機48に接続されて被制御体20を前方に進行せしめる。

ここに於て、押しボタン14を押してアンテナ17より電磁波信号を送信し、この電磁波信号をアンテナ21によつて受信してリレー24の励磁コイルに電流が流れれば、接点31と電池26の接続は断たれるので電動機48は回転を停止しようとする。

この場合に於て、電動機48の軸に第8図に示す如く、慣性輪110が設けてあるので慣性輪110の慣性によつて電動機48のアーマチユア軸は回転を続け、従つて被制御体20は尚暫くの間前進を続ける。さて、電磁波信号が到来しているので電池26は接点30と接続し、電動機27を連続的に回転せしめて居り、この電動機27の回転によつて軸62が階段的に回転し、この軸62の階段的な回転によつて表示灯117が第9図に於て表示120の位置から表示121, 122, 123の位置に階段的に回転する。

而して若し、今表示灯117が表示125の位置に至つた時に押しボタン14を離してスイツチ15を開けばアンテナ17よりの電磁波信号の送信は止んでアンテナ21への電磁波信号の到来は終る。

従つてリレー24の励磁コイルの電流は停止して電池26は接点31を介して電動機48及び制御コイル49に接続される。

よつてこの場合には被制御体20は向つて左手側に転舵し、且前進し、左進を続ける事が出来るものである。

即ち叙上の実施例に於ては、アンテナ21に電磁波信号が到来している最中は電動機48及び制御コイル49及び50の電流は断たれて居り、電動機48は慣性輪110によつてそのアーマチユア軸が回転を続けているのみである。

従つてアンテナ21への電磁波信号の到来が或る一定の時間、例えば数10秒以上続けば被制御体20はその一切の動作を停止する。

而して、アンテナ21への電磁波信号の到来が停止すれば電動機48と制御コイル49或は50に電流が通電され、被制御体20が前進、左進、右進或は後進の何れかをなすものである。

即ち叙上の実施例にあつては、アンテナ21へ電磁波信号が到来している時は原則的に被制御体20は運動を開始せず、慣性輪110の慣性によつて被制御体20は電磁波信号が到来する直前に於てなした行動を維持するものであり、アンテナ21への電磁波信号の到来が止めばその時に於て表示灯117が表示120〜125の何れに指向しているかによつて被制御体20が新たなる行動を起すものである。

即ち本発明の装置にあつては、予め選んだ数種の行動のうち任意の行動を選択して行わしめる事が出来るものであり、被制御体20の行動は従来の公知の装置の如く、必ずしも前進、右進、左進、停止等の予め定まつた組合せを順次行う必要はなく、その何れかの中から任意の行動を選択して行動せしめる事が出来るものである。

叙上の如く本発明は電磁波信号の来信によつて回転を開始する電動機、例えば電動機27と該電動機によつて駆動される動作切換装置、例えば第3図の如き装置とを有し、且電磁波信号が消滅した時に閉路される電気回路、例えば接点31によつて玩具の動作を制御する電動機構、例えば電動機48、制御コイル49, 50を電源、例えば電池26に接続する事を特徴とする玩具操縦装置であるから、二種以上の動作をなす操縦玩具に於て、任意の動作を選択して制御する事の出来る玩具操縦装置を得る事が出来るものである。

尚、本発明の実施に際しては被制御体20として必ずしも電動自動車を使用する必要はなく、電動動物、電動船舶等の電動玩具の何れに対しても同様に実施し得るものである。

叙上の説明は本発明の実施例を示したものに過ぎないものであり、本発明の実施に際してはその趣旨に反せざる限り如何様なる形態をも取り得るものである。

特許請求の範囲

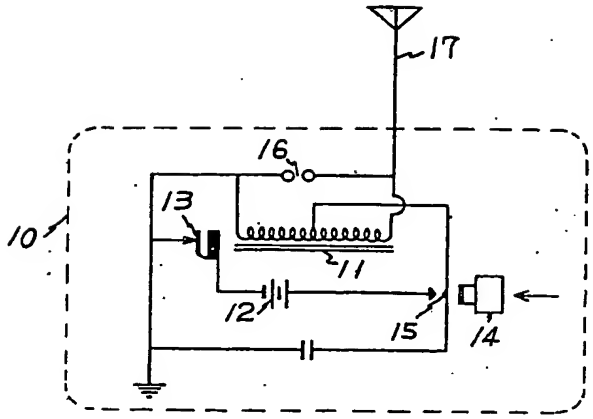
電動玩具の動作を遠隔操縦する玩具操縦装置に於て、制御信号の来信によつて回転を開始する如くなした電動機と、該電動機によつて駆動される動作切換装置とを有し、且該制御信号が到来しない時に閉路される電気回路によつて動作する他の電動機構を設け、該電動機構の動作は該動作切換装置の切換中は停止し、該動作切換が停止した時に開始される事を特徴とした玩具操縦装置。

附記

1　特許請求の範囲記載の装置に於て、該動作切換装置と連動する表示灯を有する事を特徴とした玩具無線操縦装置。

2　特許請求の範囲記載の装置に於て、該電気回路によつて動作する他の電動機構は該電動玩具の動作を駆動する電動機であり、該電動機はアーマチユア軸に慣性輪を設けた事を特徴とする玩具無線操縦装置。

第1図


17
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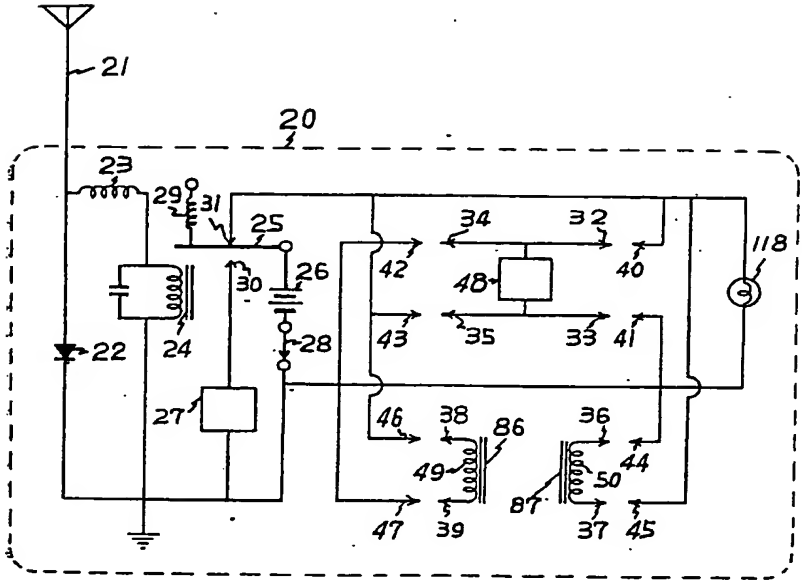
第2図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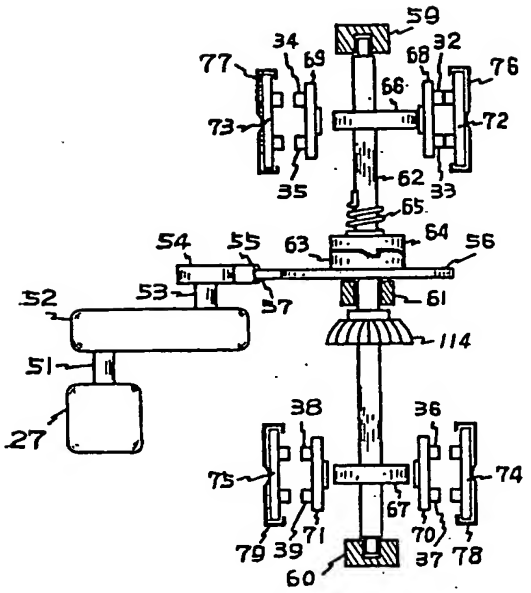
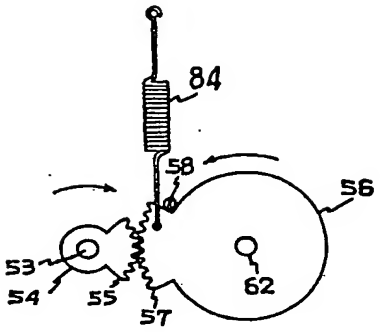
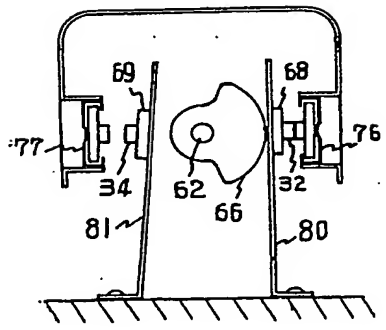
第3図



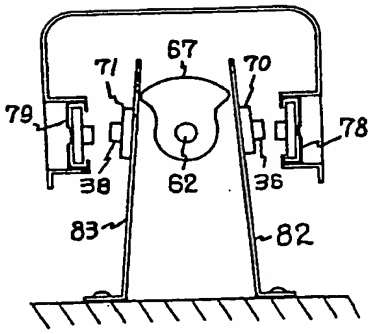
第4図



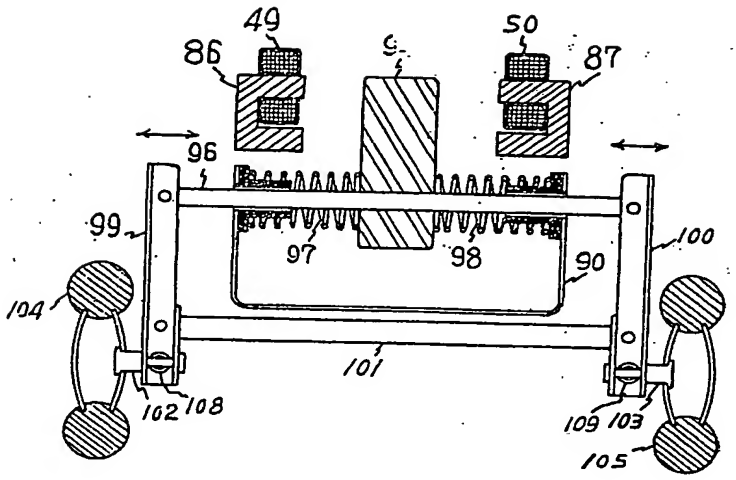
第5図



第6図



第7図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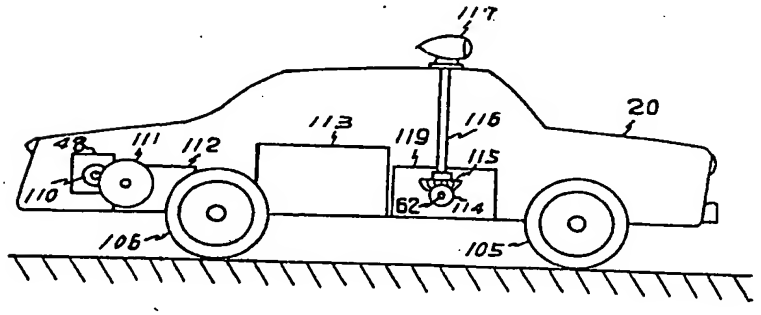
第8図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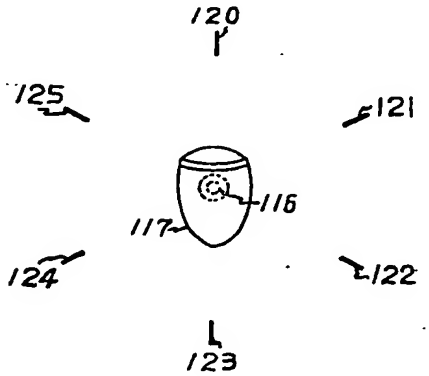
第9図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